

Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E
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Study Plan No.	2021/2022		University Specialization		Bachelor of Pharmacy	
Course No.	0201133		Course Name		Anatomy and Physiology (1)	
Credit Hours	3		Prerequisite *Co-requisite		Biology	
Course Type	☐ Mandatory University Requirement	☐ University Elective Requirement	☒ Faculty Mandatory Requirement	☐ Support course family requirements	☐ Mandatory Requirement	☐ Elective Requirement
Teaching Style	☐ Full Online Learning		☐ Blended Learning		☒ Traditional Learning	
Teaching Model	☐ 2 Synchronous: 1 Asynchronous		☐ 2 Face to Face: 1 Asynchronous		☒ 2 Traditional	

Faculty Member and Study Divisions Information (to be filled in each semester by the subject instructor)

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Name	Academic rank	Office No.	Phone No.	E-mail	
Office Hours (Days/Time)	Sunday, Tuesday, Thursday ()		Monday, Wednesday ()		
Division number	Time	Place	Number of Students	Teaching Style	Approved Model
				Traditional Learning	2 Traditional

Brief Description

This course covers the structure and function of the nervous system, sense organs, endocrine system, and the muscular system. It is designed to discuss and explain how these systems act together in complex body functions. The course also emphasizes the mechanisms of communication between these systems and their importance in maintaining homeostasis.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Human Physiology, Stuart Ira Fox, 2022, 16 th edition, Mc Graw Hill.			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Essentials of Human Anatomy and Physiology, Elaine Marieb, 2015, 11 th edition, Pearson Education, Inc. 2. Principles of Anatomy and Physiology, Gerard J. Tortora and Bryan H. Derrickson, 2012, 13 th edition, Wiley and Sons, Inc.			
Supporting Websites	-			
The Physical Environment for Teaching	☒ Classroom	☐ Labs	☒ Virtual Educational Platform	☐ Others
Necessary Equipment and Software	Moodle			
Supporting People with Special Needs	-			
For Technical Support	E-Learning & Open Educational Resources Center. Email: elarning@zu.edu.jo ; Phone: +962 6 429 1511 ext. 425/362.			

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Course learning outcomes (K= Knowledge, S= Skills, C= Competencies)

No.	Course Learning Outcomes	The Associated Program Learning Output Code
Knowledge		
The student should be able to:		
K1	Describe how homeostasis relates to the regulation of physiological processes in the body.	MK1
K2	Recognize the different mechanisms of transport across the cellular plasma membrane.	MK1
K3	Identify the structure and the main components of the nervous, special senses, endocrine, and muscular systems.	MK1
K4	Describe the functions of the body systems covered in this course.	MK1
Skills		
The student should be able to:		
S1	Explain how the nervous and endocrine systems regulate other body systems to maintain homeostasis.	MS2
Competencies		
The student should be able to:		
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Mechanisms for Direct Evaluation of Learning Outcomes

Type of Assessment / Learning Style	Fully Electronic Learning	Blended Learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm Exam	30%	30%	30%	0%
Participation / Practical Applications	0%	0%	30%	60%
Asynchronous Interactive Activities	30%	30%	0%	0%
Final Exam	40%	40%	40%	40%

Note 1: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Note 2: According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).

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Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference **
1	Introduction to Physiology; Homeostasis & feedback control: Negative feedback loops; Positive feedback; Neural & endocrine regulation; Feedback control of hormone secretion. Interactions between cells and the extracellular environment: Extracellular Environment; Diffusion and osmosis; Carrier-mediated transport.	Lecture	Chapter 1 pages 5-10 Chapter 6 pages 129-149
2	The Membrane Potential; Equilibrium potentials; Resting membrane potential.	Lecture	Chapter 6 pages 150-151
3	The Nervous System: Classification of Neurons and Nerves; Neuroglial cells; Electrical activity in axons; Ion gating in axons; Action potentials.	Lecture	Chapter 7 pages 161-164, 170-173
4	All or none law; Coding for stimulus intensity; Refractory Periods; Conduction of nerve impulses in myelinated and unmyelinated axons; Synapse; Electrical & chemical synapses.	Lecture	Chapter 7 pages 174-180
5	Actions of neurotransmitter; Acetylcholine as a neurotransmitter; chemically regulated channels; Ligand-operating channels; G-Protein-operating channels; Acetylcholinesterase.	Lecture	Chapter 7 pages 181-186
6	Central nervous system: Structural organization of the brain; Cerebrum: Cerebral cortex (Electroencephalogram, Sleep); Basal nuclei; Cerebral lateralization; Language; Limbic system and Emotion; Memory.	Lecture	Chapter 8 pages 205-219
7	Diencephalon: Thalamus and Epithalamus; Hypothalamus and Pituitary gland; Regulation of Autonomic system; regulation of circadian rhythms.	Lecture	Chapter 8 pages 224-226
8	Midbrain and Hindbrain: Midbrain; Hindbrain; Reticular Activating System in Sleep and Arousal; Spinal cord tracts: Ascending tracts; Descending tracts. Protection of the CNS (Meninges, CSF).	Lecture	Chapter 8 pages 227-234

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	Peripheral nervous system: Cranial and Spinal nerves		
9	The Autonomic Nervous System: Neural control of involuntary effectors; Autonomic neurons; Visceral effector organs; Divisions of the Autonomic nervous system; Sympathetic division; Collateral ganglia; Adrenal glands; Parasympathetic division. Midterm Exam	Lecture	Chapter 9 pages 243-250
10	Functions of the Autonomic nervous system; Adrenergic & cholinergic synaptic transmission; Responses to adrenergic stimulation; Responses to cholinergic stimulation; other Autonomic neurotransmitters; Organs with dual innervation (examples). Organs without dual innervation.	Lecture	Chapter 9 pages 250-259
11	Endocrine system: Endocrine Glands and Hormones: Chemical classification of Hormones; Hormone interactions. Mechanism of Hormone Action: Hormones that bind to Nuclear Receptor Proteins; Hormones that use second messengers.	Lecture	Chapter 11 pages 316-330
12	Pituitary gland: Pituitary hormones; Hypothalamic control of the Posterior Pituitary; Hypothalamic control of the Anterior Pituitary; Feedback control of the Anterior Pituitary. Adrenal glands: Functions of the adrenal Cortex; Functions of Adrenal Medulla; Stress & the Adrenal gland; Thyroid & Parathyroid Glands: Production & action of thyroid hormones; Parathyroid gland.	Lecture	Chapter 11 pages 330-344
13	Sensory physiology: Functional Categories of sensory receptors; Cutaneous sensations; Taste and Smell; Vestibular Apparatus & Equilibrium: Sensory hair cells of the Vestibular apparatus; Utricle & Sacculle; Semicircular canals; Neural pathways for equilibrium and balance. The Ears & Hearing: Outer Ear; Middle Ear; Cochlea; Spiral organ (Organ of	Lecture	Chapter 10 pages 266-289

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	Corti); Neural pathways for hearing.		
14	The Eyes and Vision: Refraction; Accommodation; Visual acuity; Retina: Effect of light on the rods; Electrical activity of retinal cells; Cones & color vision; Visual acuity & sensitivity.	Lecture	Chapter 10 pages 289-304
15	Muscle: Mechanisms of Contraction and Neural Control: Skeletal Muscles; Structure of Skeletal Muscles; Motor end plates and Motor units; Mechanisms of Contraction; Sliding Filament Theory of Contraction; Regulation of Contraction.	Lecture	Chapter 12 pages 359-372
16	Final Exam		

* Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.

** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.

Schedule of Asynchronous Interactive Activities (in the case of e-learning and blended learning)

Week	Task / Activity	Reference	Expected Results
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